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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/549,585

12/01/2005

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F-8766

1212

28107 7590 02/04/2009
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EXAMINER

JOHNSON, KEVIN M

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

02/04/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/549,585	Applicant(s) HIRAYAMA ET AL.	
	Examiner KEVIN M. JOHNSON	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file. The certified translations of the priority documents have been entered in the record.
2. The previously relied upon Setoguchi reference does not constitute prior art in light of the receipt of the certified translations of the priority documents.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 4-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshio et al. (US 6096243) in view of Morihito et al. (JP 2000-144129).

In regard to claim 1, Oshio teaches a phosphor of the $\text{Ba}_{0.9}\text{Eu}_{0.1}\text{MgAl}_{10}\text{O}_{17}$ type (example 1). Oshio fails to teach the inclusion of an element selected from the group including In, W, Nb, Bi, Mo, Ta, Th and Pb.

Morihito teaches a phosphorescent material comprising Eu as an activator, in which the performance of the phosphor is improved by the inclusion of a coactivator that is preferably Nb (abstract, claim 3).

It would have been obvious to one skilled in the art at the time of the invention to utilize a Nb coactivator in the phosphor material taught by Oshio. Such a modification would have been motivated by the teaching in Morihito that phosphor compounds that utilize an Eu activator achieve increased performance with the addition of an Nb coactivator.

In regard to claim 4, Morihito teaches that the amount of Nb coactivator in the phosphor is preferably between 0.0001 and 1 mol-% (paragraph 5).

In regard to claim 5, Oshio teaches that the phosphor may have the formula $(\text{Ba}_a\text{Sr}_b)\text{Mg}_e\text{Al}_{10}\text{O}_{17}$ where $0 < a < 1$, $0 \leq b \leq 1$ and $0 < e \leq 1$ (claim 73). The amount of Eu

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activator preferably used is seen in the exemplary embodiments in Oshio,

$\text{Ba}_{0.9}\text{Eu}_{0.1}\text{MgAl}_{10}\text{O}_{17}$.

In regard to claim 6, it would necessarily follow that the phosphor obviated by the teachings of Oshio and Morihito would have a whiteness value of at least 85 as expressed in terms of W value.

In regard to claim 7, Oshio teaches that the phosphor is produced by firing a mixture of precursors in a reducing atmosphere (column 6, lines 43-46).

In regard to claim 9, the mixture of precursors is fired in an oxidizing atmosphere prior to being fired in a reducing atmosphere in the process taught by Oshio (column 6, lines 5-8).

7. Claims 2, 3, 8 and 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshio and Morihito as applied to claims 1 and 7 above, and further in view of Bouchard et al. (US 3753759).

In regard to claim 2, Oshio teaches that after the phosphor is produced in the reducing step, it is rinsed and then dried with an oven (column 6, lines 64-67). It is not disclosed that the drying takes place in an oxidizing atmosphere.

Bouchard teaches that it is common to dry phosphors rinsed with deionized water in heated air (column 4, lines 17-21).

It would have been obvious to one skilled in the art at the time of the invention that the drying described in Oshio takes place in an oxidizing environment. This conclusion is supported by the teaching in Bouchard that after rinsing, phosphors are commonly dried by heating in air.

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In regard to claims 3, 10 and 12, it is not taught that the coactivator additive taught by Morihito is added to the phosphor taught by Oshio after the mixture has been fired. Oshio teaches that the host raw material mixture is fired in an oxidizing atmosphere to produce the base material for the phosphor and is then combined with the raw material for the Eu activator. The mixture is then fired in a reducing atmosphere, before being washed and dried in an oxidizing atmosphere to produce the phosphor. It would have therefor been obvious to one skilled in the art at the time of the invention to fire the base material and Eu mixture before adding the Nb coactivator precursor to the mixture. Such a modification would have been motivated by the teaching in Oshio that activators are beneficially added to an already fired raw material mixture.

In regard to claim 8, Oshio teaches that after firing in a reducing atmosphere, the phosphor is washed and then dried. It is not disclosed that the drying takes place in an oxidizing atmosphere.

Bouchard teaches that it is common to dry phosphors rinsed with deionized water in heated air (column 4, lines 17-21).

It would have been obvious to one skilled in the art at the time of the invention that the drying described in Oshio takes place in an oxidizing environment. This conclusion is supported by the teaching in Bouchard that after rinsing, phosphors are commonly dried by heating in air.

In regard to claim 11, Morihito teaches that multiple additives selected from Nb, Mo, Ta, W and Bi may be used as coactivators in alkaline earth metal phosphors. It

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would therefor be obvious to one skilled in the art at the time of the invention that additional coactivators could be added to a fired product that contains a coactivator, as the in the process taught by Oshio the activator is added to a fired mixture.

In regard to claim 13, Oshio teaches that to produce the phosphor that contains Eu effectively, the precursor mixture must be fired in a reducing atmosphere so that divalent Eu is present as the activator. It would therefor be obvious to one skilled in the art at the time of the invention that the fired mixture to which the coactivator taught by Morihito is added must have been previously fired in a reducing atmosphere.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN M. JOHNSON whose telephone number is (571)270-3584. The examiner can normally be reached on Monday-Friday 7:30 AM to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.A. LORENZO/
Supervisory Patent Examiner, Art Unit 1793

/Kevin M Johnson/
Examiner, Art Unit 1793